

IN THE SPECIFICATION:

Please amend the specification as follows:

Please insert the following paragraph beginning at page 1, line 5, as follows:

-- This application is a divisional application of copending U.S. patent application number 09/345,501, filed July 1, 1999. --

Please substitute the paragraph beginning at page 2, line 14, with the following.

-- Heretofore, in manufacturing an IC, an LSI, a liquid crystal element, etc., by photolithography technique techniques, a projection exposure apparatus is used which performs an exposure by projecting through a projection optical system a pattern of a photomask or a reticle (hereinafter referred to generally as "mask") onto a photosensitive substrate, such as a wafer or a glass plate, which is coated with a photoresist or the like. --

Please substitute the paragraph beginning at page 3, line 2, with the following.

-- For such a requirement, the projection exposure technique, which plays a main role in the art of accomplishing minute work, is being developed these days so as to form a pattern image of a line width not greater than 0.5 μm over a wider range. --

Please substitute the paragraph beginning at page 4, line 16, with the following.

-- In the above projection exposure apparatus using an excimer laser, which is currently widely used, however, it is difficult to form a pattern image of a line width not greater than 0.15 μm . --

Please substitute the paragraph beginning at page 5, line 20, and ending on page 6, line 18, with the following.

-- The attempt to shorten the wavelength, however, encounters several serious problems other than the problem related to the above formulas. The most serious problem lies in that it becomes hardly impossible to find any optical material usable for the projection optical system. An optical system which is actually mountable on the exposure apparatus as the current projection optical system in view of the amount of aberration, the precision of working, the controllability, etc., is one including a refractive system, i.e., a lens. Almost all optical materials used for lenses have transmission factors near "0" in the short wavelength region, i.e., in the far ultraviolet region. Although there are a fused quartz material, etc., as an optical material which is manufactured by a special manufacturing method for an exposure apparatus, the transmission factor of the fused quartz also abruptly drops for the wavelength not greater than 193 nm. It is thus extremely difficult to develop any optical material practically usable for an exposure wavelength not greater than 150 nm required for a pattern of a line width not greater than 0.15 μm , because the optical material is required to satisfy a plurality of conditions relative to durability, uniform refractive index, optical strain, workability, etc., in addition to the transmission factor. --

Please substitute the paragraph beginning at page 6, line 17, with the following.

-- The above conventional projection exposure method necessitates the shortening of the wavelength for performing a pattern exposure depending on the formulas (a1) and (a2), and, therefore, causes a problem in that there exists no usable optical material, so that it is impossible to realize an exposure for a pattern image of a line width not greater than 0.15 μm . --

Please substitute the paragraph beginning at page 9, line 6, with the following.

-- While, according to the two-light-flux interference exposure method, the resolution corresponding to the line width of not greater than 0.15 μm can be accomplished, the resolvable pattern is limited to a repetitive pattern of uniform pitch, so that it is impossible to perform an exposure with a sufficiently various kinds of circuit patterns required for the practical semiconductor devices. --

Please substitute the paragraph beginning at page 9, line 14, with the following.

-- Further it is widely known that the Levenson-type reticle is used in order to realize the two-light-flux interference exposure method using a projection exposure apparatus. However, there is a problem that it is difficult to make such a Levenson-type reticle that has a sufficiently various kinds of circuit patterns required for the practical semiconductor devices. In addition, in the case of usage of the Levenson-type reticle, the oblique incidence illumination is inferior in contrast, and there is such a limitation that the inclination of an incident light beam has no freedom (allowing only one angle). --

Please substitute the paragraph beginning at page 9, line 26, and ending on page 10, line 1, with the following.

-- To solve the above problems, a multiple exposure method using both a two-light-flux interference exposure and a projection exposure has been proposed in Japanese Patent Application Laid-Open No. Hei 9-304232 11-143085. --

Please substitute the paragraph beginning at page 10, line 2, with the following.

-- Next, the multiple exposure method proposed in Japanese Patent Application Laid-Open No. Hei 9-304232 11-143085 will be explained taking an example thereof. --

Please substitute the paragraph beginning at page 21, line 1, with the following.

-- BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE ~~DRAWING~~
DRAWINGS --

Please substitute the paragraph beginning at page 25, line 22, and ending on page 26, line 3 12, with the following.

-- In the case of the multiple exposure method shown in Fig. 1, if a maximum exposure amount for the two-light-flux interference exposure step is set to "1", the exposure threshold value of the resist is set to a value greater than "1". In the photosensitive resist as set in the above manner, in a case where an exposure pattern obtained as shown in Fig. 2(A) by carrying out only the two-light-flux interference exposure is developed, the exposure amount is

insufficient, and although the film thickness somewhat varies, there ~~exist~~ exists no portion where the film thickness becomes "0", so that ~~any~~ no lithography pattern is ~~not~~ formed. Thus, the two-light-flux interference exposure pattern can be considered to have disappeared. (In the following, the use of a negative resist is described by way of example. However, the invention is of course not limited to the use of the negative type nor that of the positive type. Both types of resists are selectively usable as desired in accordance with the invention.) --

Please substitute the paragraph beginning at page 27, line 7, with the following.

-- In the exposure apparatus shown in Fig. 5, when the two-light-flux interference exposure is to be performed, the pupil filter as indicated by l9a in Fig. 5 is used with the illumination method set to the coherent illumination (the so-called small- σ (coherence factor) illumination using parallel or approximately-parallel fluxes incident on the mask), and the mask is changed over to a two-light-flux interference mask, which will be described later. Further, when the ordinary projection exposure is to be performed, the pupil filter as indicated by l9b in Fig. 5 is used, or no pupil filter is used with the ~~all~~ all the pupil filters retracted, with the illumination method changed over to the partly-coherent illumination or the like, and the mask is changed over to an applicable mask. --

Please substitute the paragraph beginning at page 42, line 1, with the following.

-- Fig. 17 is a diagram for explaining an exposure pattern obtainable according to the third embodiment. The exposure pattern is formed over a wider area by varying the amount of

exposure in the projection exposure in units of a block. In Fig. 17, numerals indicate the amounts of exposure of the respective blocks in the projection exposure step to form such an exposure pattern. --